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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/763,070 | 01/22/2004 | Jean-Luc Morand | S1022.81118US00 | 3710 |
| 23628 | 7590 | 12/29/2005 | EXAMINER | |
| WOLF GREENFIELD & SACKS, PC FEDERAL RESERVE PLAZA 600 ATLANTIC AVENUE BOSTON, MA 02210-2211 | | | NGUYEN, THINH T | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2818 | |

DATE MAILED: 12/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,070

Applicant(s)

MORAND, JEAN-LUC

Examiner

Thinh T. Nguyen

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 10-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-9 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. This is in response to Applicant 's communication on 10/19/2005.

Note that the figures and reference numbers referred to in this Office Action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

2. Claims 1-39 are presented for examination including new additional claims 10-39.
3. Newly submitted claims 10-39 are directed to inventions that is independent or distinct from the invention originally claimed for the following reasons:

I/ Species I : Claims 1-9: as best as it can be understood is described in claim 1 with all the technical features as recited in claim 1.

II/ Species II : Claims 10-16 : as best as it can be understood is described in claim 10 with all the technical features as recited in claim 10.

III/ Species III : Claims 17-39: as best as it can be understood is described in claim 17 with all the technical features as recited in claim 17.

Since applicant has received an action on the merits for the originally presented Invention (i.e. Species I) , this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 10-39 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1. 142(b) and MPEP 821.03.

4. Applicant's amendments to independent claim 1 have necessitated new grounds of rejection for claims 1-5,7-9. See MPEP § 706.07(a).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claim 1 is rejected under 35 U.S.C. 102 (b) as being anticipated by Pfirsch (US patent 6,201,279).

REGARDING CLAIM 1

Pfirsch (in fig 3, fig 6,fig 7, column 2 lines 35-44,column 6 lines 42-51) discloses

Art Unit: 2818

A semiconductor component in which the active junctions extend perpendicularly to a first surface of a semiconductor chip substantially across an entire thickness thereof, wherein the semiconductor chip has a first metallization associated with the first surface and a second metallization associated with a second surface, the first and second surfaces being on opposing sides of the semiconductor chip.

Fig. 2

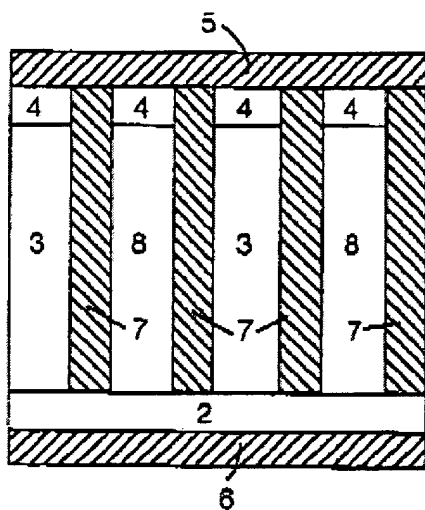
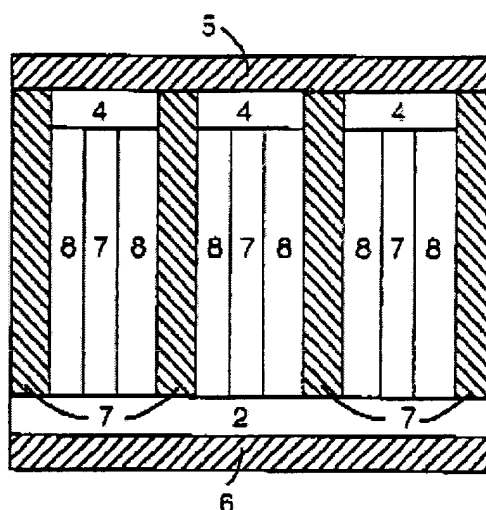


Fig. 3



Noted that electrodes 5 and 6 in Pfirsch disclosure can be aluminum (Column 6 lines 42-51 of the Pfirsch reference) therefore they are inherently metallization layers.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. §103(a), which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2818

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 2,4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al (US patent 6,410,958) in view of further remark.

REGARDING CLAIM 2

Usui (the abstract, in fig 2, fig 4) discloses all the invention of a semiconductor component in which the active junctions extend perpendicularly to a first surface of a semiconductor chip substantially across an entire thickness thereof wherein the semiconductor chip has a first metallization associated with the first surface (column 5 line 7 source metal wiring 90) wherein the contacts with the regions to be connected are provided by conductive fingers (see fig 4) substantially crossing an entire region with which a contact is desired to be established.

Missing in Usui reference is a metallization contact of the drain layer, this feature however is considered obvious because the metallization of the drain layer is old and well known in the art as evidenced by the disclosure by Hurkx et al. (US patent 6,624,472) in column 6 lines 49-50 in fig 1 layer 15,16.

A person skilled in the art the time the invention was made would be able to provide a bottom electrode metallization layer for the device invented by Usui without any special instruction.

REGARDING CLAIM 4

Usui (in fig 4) disclose a multi-cellular semiconductor wherein the junction are formed of several cylinders perpendicular to the first surface.

The rationale why claims 4 is obvious under Usui has been set forth in the rejection of claim 4.

9. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anthony et al (US patent 4,032,960) in view of further remark.

REGARDING CLAIM 2

Anthony (in fig 3, fig 5) discloses all the invention including a semiconductor with The regions to be connected are provided with conductive fingers.

Missing in the disclosure by Anthony is two opposite metallization layers.

Anthony discloses , however, layer 30 is ohmic contact and the fact that metal layers are used for ohmic contact are old and well known in the art.

A person skilled in the art at the time the invention was made would know how to make these contacts metallic.

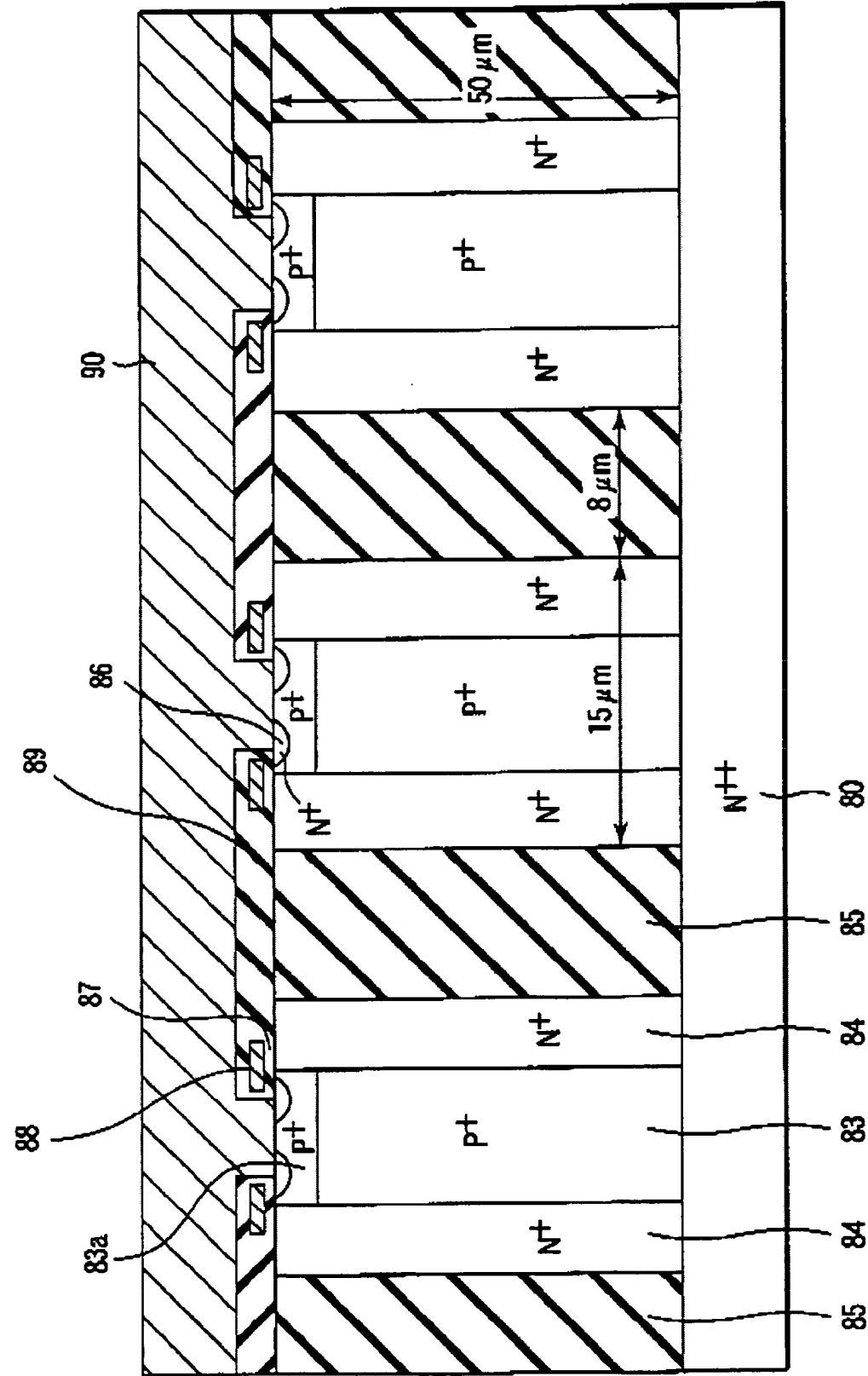


FIG. 2

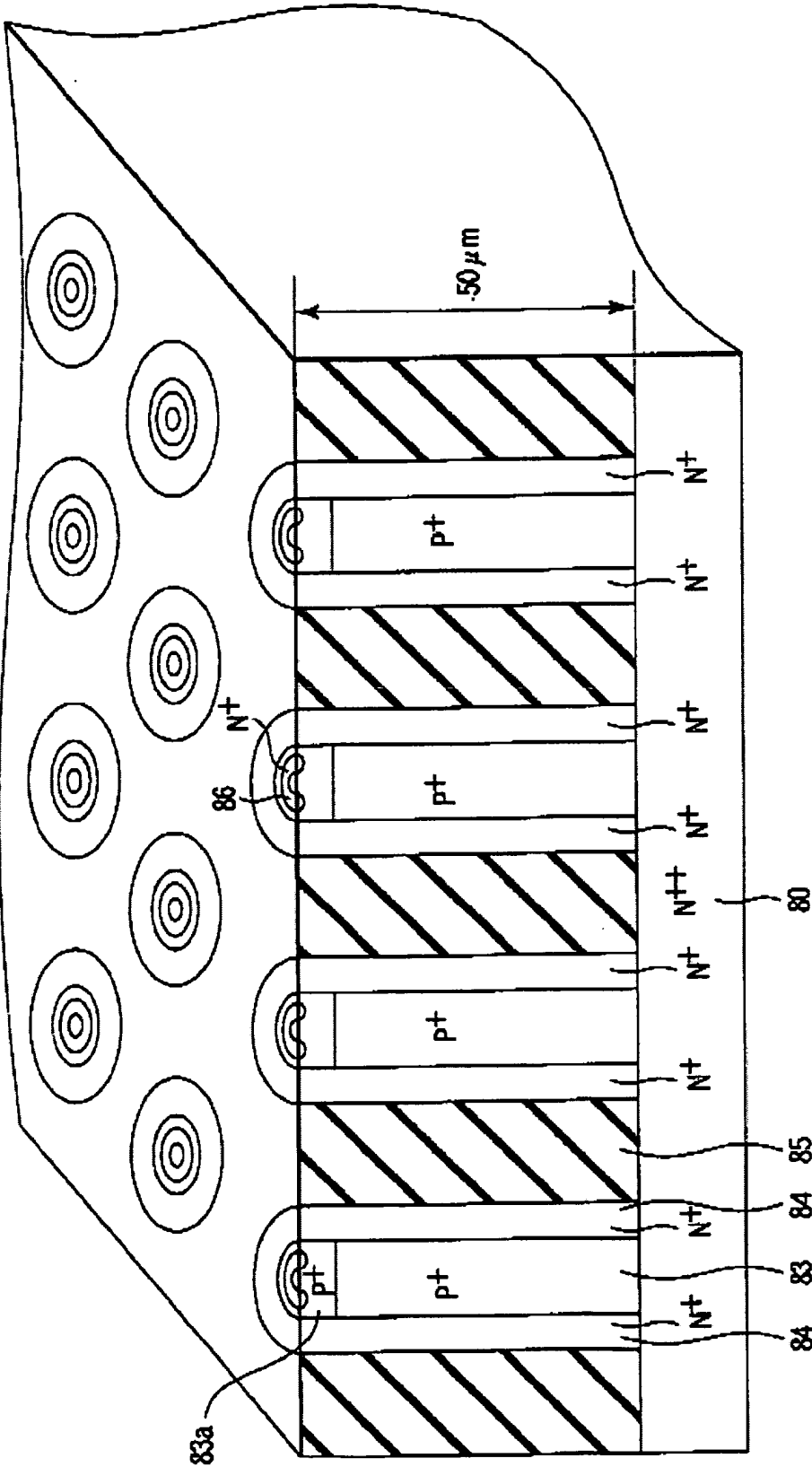
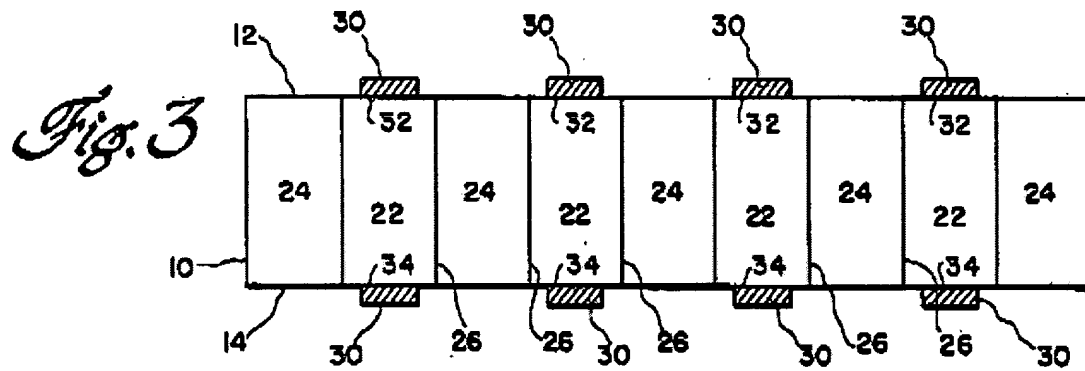
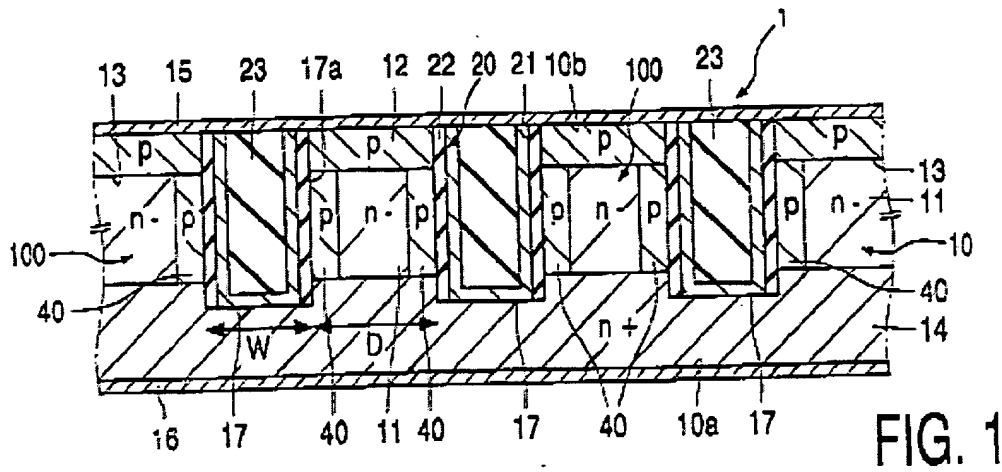
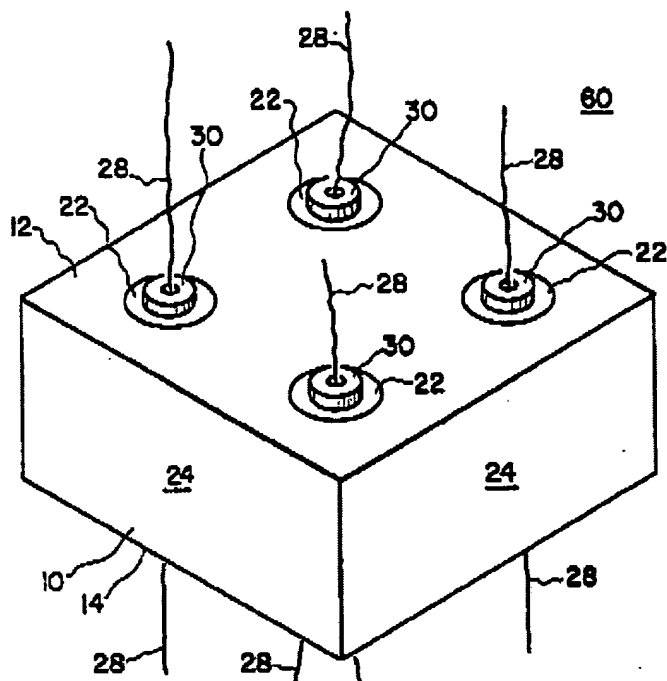


FIG.4





10. claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pfirsch (US patent 6,201,279) in view of Usui et al (US patent 6,410,958).

REGARDING CLAIM 5

As discussed in the rejection of claim 1, Pfirsch discloses all the invention including the structure of a diode (column 4 line 7). Missing in Pfirsch disclosure is the uses of conductive fingers. Usui, however, (in fig 4) discloses the use of conductive fingers.

It would have been obvious for a person of ordinary skilled in the art at the time the invention was made to complement the teachings by Pfirsch with the teachings by Usui and come up with the inventions of claim 5.

The rationale is as the following:

A person of ordinary skill in the art at the time the invention was made would have been motivated to improve the device invented by Pfirsch with the teachings by Usui to make it easy to manufacture, high in breakdown voltage and low in on resistance as suggested by Usui (column 2 lines 20-24)

11. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rouse (US patent 3,128,530) in view of Kobayashi et al. (US patent 3,925,803) and in further view remark.

REGARDING CLAIM 7

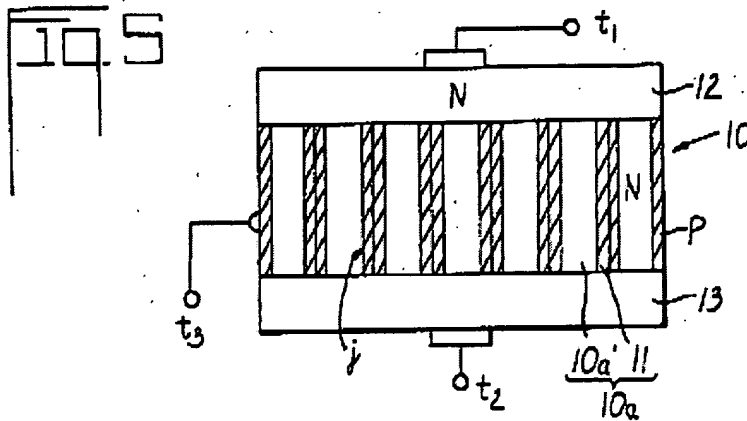
Rouse (fig 5,claim 2) disclose all the invention including a transistor device (see claim 2) except for the use of conductive fingers on all three transistor terminals. Kobayashi et al., (fig. 5), however teach how to connect conductive fingers to a three terminal devices.

It would have been obvious to one ordinary skill in the art to complement the teachings by Rouse with the teachings by Kobayashi et al. and come up with the invention of claim 7.

The rationale is as the following:

A person skilled in the art would have been motivated to improve the semiconductor device as suggested by Kobayashi in column 1 lines 32-36.

Noted that Kobayashi has terminal T1 and T2 that can be metallized.



12. Claims 8,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna (US patent 3,988,771) in view of Kobayashi et al. (US patent 3,925,803) and in further view remark.

REGARDING CLAIM 8,9

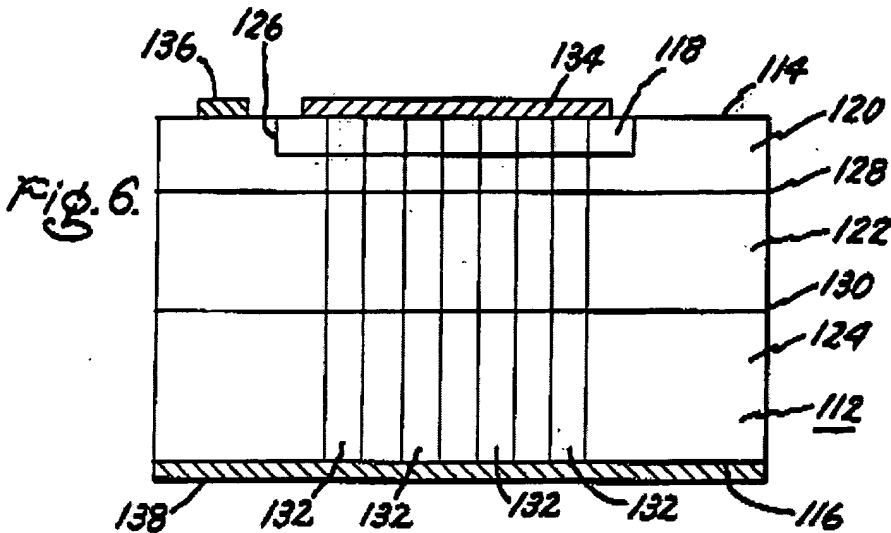
Krishna (fig 6) disclose all the invention including a thyristor device (column 1 line 14) except for the use of conductive fingers on all three thyristor terminals. Kobayashi et al., (fig. 5), however teach how to connect conductive fingers to a three terminal devices.

It would have been obvious to one ordinary skill in the art to complement the teachings by Khrisna with the teachings by Kobayashi et al. and come up with the invention of claim 8,9.

The rationale is as the following:

A person skilled in the art would have been motivated to improve the semiconductor device as suggested by Kobayashi in column 1 lines 32-36.

Noted that Krishna discloses in fig 6 a device that can has electrode layer 134, 116 On the opposite sides of the semiconductor device metallized.



ALLOWABLE SUBJECT MATTER

13. Claims 6 is objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

Claim 6 is considered allowable since the prior fails to teach the limitation wherein the conductive fingers penetrating into the N-type regions are surrounded with heavily doped N-type regions.

CONCLUSION

14. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone number is 571-272-1790. The examiner can normally be reached on 9:30 am - 6:30 pm Monday to Friday..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on 571-272-1787. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300

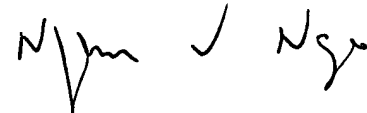
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [PAIR] system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

Art Unit: 2818

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thinh T Nguyen 

Art Unit 2818



Pham Van Ngo
Primary Examiner